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# East Europe Report

SCIENTIFIC AFFAIRS

(FOUO 9/81)



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BULGARIA

REPORT ON LAUNCHING, OBJECTIVE OF SATELLITE INTERCOSMOS-BULGARIA 1300

Paris AIR & COSMOS in French 29 Aug 81 p 43

[Article by Serge Berg]

[Text] On 7 August, the USSR launched the first Bulgarian satellite, Intercosmos-Bulgaria 1300, the placing in orbit of which commemorates the 1300th anniversary of the founding of the Bulgarian state.

This satellite, built under the Soviet Intercosmos space cooperation program, incorporates a satellite of the Soviet Meteor satellite type. This 22d Intercosmos satellite is one of the most technically advanced of the series. For the first time, the satellite is entirely covered by a very thin metallic film to avoid the buildup of electrostatic charges that would otherwise disturb its instruments, and all its sensors are mounted at the ends of 4- to 5-foot-long masts deployed in orbit.

The satellite was positioned on an 825-/906-km orbit inclined at  $81.2^\circ$  and traversed in 101.9 minutes. Its primary mission is the study of the ionosphere and of the terrestrial magnetosphere during periods of intense solar activity. The operational life of its active instruments, which are 12 in number (and weigh more than 350 kg), is 6 months. Its complement of instruments includes:

--seven apparatuses for studying the electrons and ions (concentration, temperature, energy, ion masses) and the movement of the ionospheric plasma;

--one apparatus for measuring variable and constant electric fields, and one ultrasensitive magnetometer;

--one electrophotometer for recording the weak luminous rays of the upper atmosphere, and one instrument for recording ultraviolet radiation;

--and one five-sided reflecting prism for the precision-measurement of the coordinates of earth stations, movements of the earth's crust, perturbations in the earth's rotation, movements of the poles, etc. This laser-reflector will enable the Soviet stations, but also French ones (CERGA [expansion unknown]), to track the satellite.

According to Mr Giorgi Kitov of the Bulgarian Academy of Sciences Archaeological Institute, the satellite will also be used for the "study of 49 Bulgarian

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archeological sites, by means of observations (down to 30-meter depths) that will help detect the existence of walls and objects buried under tumuli formed in ancient Thrace.

The Intercosmos-Bulgaria 1300 project includes also a second part, which was placed aboard the Meteor-Priroda observation satellite launched 10 July 1981. This consisted of a Bulgarian multichannel spectrometer for earth observations during different seasons.

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CZECHOSLOVAKIA

RABIES IN CSSR PERMANENT EPIDEMIOLOGICAL PROBLEM

Prague CASOPIS LEKARU CESKYCH in Czech No 22 81 pp 686-687

[Text] Symposium of the Society of Czech Physicians in Prague, Evening of March 2, 1981. Coordinator: Prof Jiri Havlik, MD, Candidate of Science, Chair of Infectious Diseases, Hygiene and Epidemiology, Faculty of Pediatrics, Charles University, Prague.

Participants in the symposium: staff members of the Clinic of Infectious Diseases in Prague 8; State Veterinary Institute in Liberec-Vratislavice; Institute of Sera and Vaccines in Prague; and Laboratory of Infectious Diseases of the Faculty of Pediatrics, Charles University, Prague.

J. Havlik: What Is New in Clinical Aspects of Rabies

Rabies has lost none of its dangerousness as known in the past. It is still frequent in wild animals, especially foxes, both in our country and in most of Europe. Although various prophylactic measures have reduced the incidence of human infections, the disease is still practically fatal for anyone who shows its clinical signs. Isolated recoveries are questionable.

Infection follows even small wounds inflicted by animals, dogs and cats in particular, which were bitten by rabid foxes. The greatest danger comes from wounds, bites or scratches, on those parts of the body unprotected by clothing, such as the face and hands. Possible, although rare, is indirect transmission when the infectious agent enters small abrasions on the hands while sick or dead animals are handled without gloves.

The infection spreads from the periphery through sensory nerve fibers to the posterior spinal roots and then to the central nervous system. The usual incubation period is 30 days and more, but it may be considerably shorter, depending on the virulence of the strain and other factors. Paresthesia at the site of the wound and its vicinity is listed most among the possible signs of the disease in the prodromal stage. As the infection develops, nervousness, lack of concentration, aimless pacing, uncoordinated speech, restlessness and fear of death are typical.

The typical sign of the disease, hydrophobia, appears 2 to 4 days later; painful spasms of the deglutination muscles at attempts to drink and even in response to the sound of running water and other light or sound stimuli. Concurrently there is a rise in the temperature and intensified sweating and excretion of saliva.

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Restlessness increases, tremors occur and tetanic spasms in all body muscles. During the attack of spasms the patient does not recognize his surroundings and may be dangerous to the nursing personnel. In between he is fully conscious and aware of the enormity of his plight. Death generally occurs during the spasms in the course of several days. If the patient survives the phase of spasm, the hydrophobia usually disappears, but ascending paralyzes soon end his life.

Atypical cases have become more frequent in recent years; at times there was no contact with a sick animal; at other, paralyzes occurred without preceding hydrophobia, i.e. dumb rabies. Two cases following cornea transplants from deceased donors, in whom only later rabies were confirmed, were also reported.

Although passive and active immunization does not always prevent morbidity, it is the chief protection against rabies, when administered in time, of course.

O. Matouch: Incidence of Rabies in Animals in CSR

Rabies is endemic on the territory of the CSSR and represents a permanent epizootiological and epidemiological problem. In the years 1976-80 a total of 26,203 animals of 44 species were examined for rabies in the CSR. Most of the animals examined were foxes (62.5 percent), dogs (13.7 percent) and cats (10.3 percent). Rabies was confirmed in 3,460 cases; 3,280 cases (94.8 percent) in wild animals and 180 cases (5.2 percent) in domestic animals. Among the wild animals, the highest incidence was recorded for foxes (3,098) which occupy an important place in the epizootiology of rabies and represent the main vector of infection on our territory. Furthermore, 77 cases were diagnosed in deer, 49 in badgers and 44 in martens.

Among domestic animals, cats have acquired greater importance in the course of the last 5 years; rabies was found in 93 cases, while dogs with 62 cases have shown a declining tendency. The course is characteristic, with maximum incidence in March and April and a lower one in May and June.

With regard to geographical localization, a gradual spread from the western and northern borders into the interior of the state has been noted since 1976. At present, rabies has been recorded in more than 40 districts of the CSR.

Control measures of rabies are directed foremost at the reduction of population density of the common fox, the main vector of rabies on our territory. Obligatory and free vaccinations of dogs are carried out on the entire territory of the state.

D. Slonim: Immunization of Man against Rabies

Immunization is the only specific protection man has against rabies. Pre-exposure immunization is a prophylactic inoculation having practically full (100 percent) effectiveness. Postexposure immunization is an atypical immunization process, as it is carried out after the infectious contact and, therefore, at times may fail. At present, it combines passive immunization (hyperimmune animal antirabies serum or human antirabies immunoglobulin) and active immunization with vaccines whose effect is boosted and prolonged by suitably selected reinoculations.

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The original Pasteur vaccine (1885), like all its later modifications, were and are prepared from nerve tissue of animals infected with Pasteur "virus fix." Beside their other disadvantages, they may produce neuromuscular complications in man. Neither the specially purified vaccines nor those prepared from the brains of suckling animals proved to be better.

The vaccine from duck embryos marked a considerable advance, but only the vaccines prepared in tissue cultures ultimately represent a truly modern preparation of high safety and effectiveness. The most effective and probably the safest of them are those which use a virus reproduced in cultures of human diploid cells. Virus of these vaccines is purified, concentrated and either inactivated with beta-propiolactone (whole-virus vaccine) or inactivated and split with tri-n-butyl phosphate (subunit vaccine). These vaccines have immunogenic activity about 100 times higher than the vaccines prepared from animal nerve tissues or duck embryos, and only mild side reactions have been recorded after their administration.

E. Moravcova: Antirabies Centers and Their Importance in Rabies

Rabies in humans is rare but still fatal. The main effort continues to be directed at prevention of the occurrence of the disease through effective prophylaxis. Timely administration of antirabies globulin and of vaccine, together with immediate treatment of the wound, are the main means of protection for man.

The quality and effectiveness of vaccines have improved since the time of Pasteur, but the basic principles remain the same. Repeated administration of the vaccine is needed to attain the protective level of antibodies; and with the vaccines prepared from animal nerve tissues this leads to frequent neurological complications. Therefore, since 1967, we gradually phased out inoculations with Hemptov vaccines on the outpatient basis and established antirabies centers in all regions of the CSR. Their aim was to insure a uniform and safest possible prophylactic approach, hospitalization of vaccinated individuals and, through proper indications, prevention of unnecessary inoculations while insuring essential prophylaxis.

The basic care for individuals wounded by animals starts with the physician of the first contact. The district or plant physician, or a pediatrician, provides the basic surgical treatment of the wound, prophylaxis against tetanus and, if the owner of the animal responsible for the wound is known, has the animal examined by a veterinarian. Individuals injured by rabid or suspect animals and unclear cases are referred to the antirabies center, where indications for prophylaxis are determined in cooperation with hygienic stations and veterinary facilities. Decision is often difficult; it depends on the nature of the wound, the animal species and its behavior at the time the wound was inflicted, and on the epidemiological situation in the given area.

Between 3,000 and 6,000 people are reported annually in the CSR as being bitten by animals of various species, and about one-sixth of them undergo antirabies prophylaxis.

At present, a new type of vaccine prepared in tissue culture is used for inoculations; it has essentially fewer undesirable side effects and higher antigenic effectiveness.

Recent studies have tried to utilize interferon or its inducers for postexposure immunization with the aim of using such preparations instead of immune serum or immunoglobulin.



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S. Doutlik: Complications Following Antirabies Inoculations

The development of antirabies inoculation over almost a full century has always been associated with the incidence of complications, especially of the nervous system.

It was Louis Pasteur with his vaccine who provided the stimulus for studies that led to the discovery of experimental allergic encephalomyelitis, which became a model for human demyelinations related to autoimmune mechanisms. Their prototype was found in neurological complications following Hemptov antirabies vaccines containing a suspension of brain tissue. Clinical disorders had their correlate in the EEG changes and in immunopathological findings which in their frequency have exceeded the level of tolerance.

Even the improved Rabivac vaccine, used in the period 1972-79, produced subclinical autoimmune manifestations signaling later clinical complications. The surprising finding of an undiminished percentage of humoral brain antibodies and sometimes even cell sensitization to brain antibodies following the administration of the vaccine prepared on kidney cell tissue, and used in the CSR since 1978, is a warning that neurological complications may occur even with this vaccine.

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